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EXAMINER				
ROBERTSON, DAVID				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/802,524

Applicant(s)

VEENINGEN ET AL.

Examiner

Dave Robertson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 3/17/2004
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This is a Non-final office action examining claims 1-70.

Claim Objections

2. Claims 43 and 44 are objected to because of the following informalities:

Claim 43 depends from claim 44; claim 44 depends from claim 43. Thus claim 43 depends from a higher numbered claim 44 (see also 112(2) rejection below).

Appropriate correction is required.

Double Patenting

3. Claims 1-70 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-44 of copending Application No. 10/802,613. Although the conflicting claims are not identical, they are not patentably distinct from each other because the inventions are directed to substantially similar automated methods of gathering, comparing, ranking, and displaying risk data, wherein the gathering, comparing, ranking, and displaying are related to well-bore (drilling) activities.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a step of *receiving input data...including a plurality of input data calculation results*. It is unclear what is encompassed by a *plurality of input data calculation results* as no source or manner of producing calculation results are specified. For the purposes of examination the limitation will be interpreted as *a plurality of input data*.

Claims 1, 25, and 64 recite a step of *generating said risk information* where the antecedent basis for *said risk information* is found only in the preamble of the claims: A method of *determining and displaying risk information in response to a plurality of input data...* Because *said risk information* has no antecedent basis in the body of the claim it may be that this risk information the method will be generating and displaying. However, it is unclear that said risk information to be displayed in the last step of claim 1 is risk information *generated in response to ranked risk values* or some other risk information determined in a manner wholly separate from the generating step. For the purposes of examination the *displaying* step will be interpreted as displaying the

generated risk information determined in the preceding step or some other risk information determined in response to input data.

Claims 5 and 29 recite: *wherein risk categories are selected from...a potential risk for each design task...* However, there is insufficient antecedent basis for *each design task* in the claim and so it is unclear how one would determine a potential risk for some unknown or unspecified set of design tasks.

Claim 43 depends from claim 44 and claim 44 depends from claim 43, a circular dependency making the scope of claims 43 and 44 indefinite. Because claim format (see objection above), antecedent basis, and embodiment consistency requires claim 43 to at least depend from claim 26 (the program storage device embodiment first introducing generation of *ranked categories*), it will be assumed for the purposes of examination that claim 43 depends from claim 26 and claim 44 from claim 43.

Claims 50-63 recite mathematical equations without identification and proper use of each variable and subscript used in the formulas. As such the formulas are indefinite. For the purposes of examination, the formulas will be interpreted as calculating risk values as best can be determined from the formula and associated disclosure.

Claims 53-56 and 60-63 further recite mathematical formulas having summation bounds with specific values for the number of categories or indices (e.g. claim 53, summation $[k=]1..4$; claim 55, summation $j=1..55$). However, it is unclear whether the claims intend a narrow scope of a *specific* number of categories or severity indices, and if so, what is the particular utility of the specific

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summation range, as from the specification (see pages 49-54) the bounds appear to be exemplary only. For the purposes of examination, the summation ranges will be taken as specifically recited, however, given appropriate weight as to the design choice of a specific number of categories or indices.

Claims not specifically named above depend from one of claims 1, 25, or 64 and are similarly deficient for reason(s) given above for their respective parent claims.

Claims 64-70 recite: *A system adapted for...comprising apparatus adapted for...* However, it is unclear as to what structural element(s) of the disclosed invention comprise the *apparatus adapted for*. The specification discloses both general purpose computer apparatus (§[0067] and software apparatus adapted for the functions recited (§[0030], therefore the claim may encompass either structure or software per se. For the purposes of examination, the claims will be interpreted as reciting general purpose computer structure as disclosed in §[0067].

Appropriate amendment and/or clarification is requested.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-24 and 49-56 rejected under 35 U.S.C. 101 based on Supreme Court precedent, and recent Federal Circuit decisions:

For a process to be patentable subject matter under § 101 the process must (1) be tied to another statutory class of invention (such as a particular apparatus) or (2) transform subject matter to a different state or thing. See *Diamond v. Diehr*, 450 US 175, 184 (1981); *Parker v Flook*, 437 US 584, 588 n9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 US 780, 787-88 (1876). If neither of these requirements is met by the claim, the method is not a patent eligible process. To qualify under § 101 as a statutory process, the claim should positively recite the other statutory class (the thing or product) to which it is tied, for example by identifying the apparatus that accomplishes the method steps, or positively recite the subject matter that is being transformed, for example by identifying the material that is being changed to a different state.

In the present case, none of claims 1-24 or 49-56 recite transforming subject matter to a different state or thing, or recite a sufficient tie to another statutory class of invention, such as a particular apparatus. Rather, the method could be performed entirely by a human, by hand, or by mental steps. As such the invention as claimed is nonstatutory and therefore ineligible for patenting under U.S.C. 101.

8. Claims 64-70 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 64-70 recite: *A system adapted for...comprising apparatus adapted for...* However, the specification discloses both general purpose computer apparatus (§[0067] and software apparatus (disembodied software *per se*) adapted for the functions recited (§[0030], therefore the claim encompasses

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both the computer structure as disclosed or software per se. Claims encompassing both statutory and non-statutory subject matter such as disembodied software per se are non-statutory.

Appropriate amendment is requested.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-70 are rejected under 35 U.S.C. 103(c) as being unpatentable over Weinstock et al. (US 6,223,143) in view of Lavu et al. (US Pat. Pub. 2005/0060213).

The present invention discloses automated methods for risk assessment of wellbore design properties. The present invention *claims* automated methods of generalized risk assessment using data not specifically (and when specifically, not functionally) related to wellbore design.

Weinstock and Lavu each disclose automated methods of generalized risk assessment, ranking, and display of risk information.

Specifically, with respect to the claims presented:

Claim 1

Weinstock teaches **a method of determining and displaying risk information in response to a plurality of input data** (see Abstract) comprising:

receiving said plurality of input data, said input data including a plurality of input data calculation results (see Abstract);

generating said risk information in response to said plurality of ranked risk values (see Figures 16, 17; column 3 lines 24-34);

and displaying said risk information (see Figure 28).

However, Weinstock does not expressly teach:

comparing each calculation result of said plurality of input data calculation results with each logical expression of a plurality of logical expressions, ranking by said logical expression said calculation result, and generating a plurality of ranked risk values in response thereto, each of said plurality of ranked risk values representing an input data calculation result that has been ranked by said logical expression as either a high risk or a medium risk or a low risk.

Lavu et al. teaches automated and generalized risk assessment using logical expressions to rank risk values as high, medium, or low risk (see ¶[0018]). Lavu teaches such ranking categories allows display of risk information by risk factor (Figure 8a) to better highlight risks needing varying degrees of attention (see ¶[0049]). It would have been obvious to one of ordinary skill in the art at the time of the invention to improve Weinstock by categorize risks as high, medium, and low risks to display such risk information as this would have

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provided the user risk information drawing attention to risks needed varying degrees of attention.

Claim 2

Weinstock teaches **one or more ranked risk categories** (Figure 5A, Item 59).

Claim 3

Weinstock teaches **one or more ranked subcategory risks** (Figure 6 and related; Failure Mode is a "subcategory" of Subsystem risk).

Claim 4

Weinstock teaches **a plurality of ranked individual risks** (see Figures 6, 17 and related; failure modes are individual risks as are risks associated with individual elements).

Claim 5

Weinstock teaches **wherein said risk categories are selected from a group consisting of an average individual risk, a subcategory risk, an average subcategory risk, a total risk, an average total risk, a potential risk for each design task, and an actual risk for each design task** (see Figure 28 and related).

Claim 6

Weinstock teaches **wherein said subcategory risks of said risk categories is selected from a group consisting of gains risks, losses risks, stuck pipe risks, and mechanical risks** (see Figure 28; e.g. 'Housing Structural Failure' is a mechanical risk).

Claim 7

Weinstock does not expressly teach **wherein said individual risks are selected from a group consisting of [a set of risks associated with wellbore drilling]**. However, risk data associated with wellbore drilling amounts to nonfunctional data in the context of the claim. As the particular risk data has no structural affect on the invention as claimed, it would have been obvious to one of ordinary skill in the art at the time of the invention that any such data may be entered into Weinstock's generalized risk assessment system, for example, a set of risk data associated with wellbore drilling, as this would have provided the user of such data automated means of evaluating risks associated with this particular application area.

Claim 8

Weinstock teaches **receiving said plurality of ranked risk values and calculating said one or more ranked risk categories** (see Figure 5C 'Analysis Module' 'Risks ranked by subsystems and Failure Modes').

Claim 9

Weinstock teaches **displaying said one or more ranked risk categories** (see Figure 21 and related discussion of analysis results exported to Tool Box for 'View Analysis Results')

Claims 10 and 11

Weinstock teaches **receiving said plurality of ranked risk values and calculating said one or more ranked subcategory risks** (see Figure 21, subcategory risks calculated as in Figure 6 by 'Failures Mode Quantification'); **wherein the step of displaying said risk information comprises displaying said one or more ranked subcategory risks** (displayed as above in claim 9).

Claim 12

Weinstock teaches **receiving said plurality of ranked risk values and using said plurality of ranked risk values to represent said plurality of ranked individual risks** (see ¶[0000] page column line).

Claims 13-24 and 49 recite limitations substantially as recited above in claims 1-12 and are similarly rejected for reasons given above for the respective claim and claim elements.

Claims 25-48 recite a program device for performing substantially the method(s) of claims 1-24, and are similarly rejected for reasons given above for the respective claim and claim elements, and further that Weinstock discloses automated methods embodied on computer readable media (see Figure 2).

Claims 50-63 recite formulas for calculating risk information as claimed above in claims 1-24; however, while Weinstock teaches calculating risk

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information as above, including severity weighted risk information (see column 12, esp. Table 1) Weinstock does not expressly teach the particular *formulas* for calculating averages and weighted averages.

Official notice is taken as old and well known the formulas for calculation of averages and severity weighted averages, and that such formulas would have been well within the ordinary skill in the art at the time of the invention. It would have been obvious to apply such formulas to Weinstock's calculations of risk information as this would have provided a mathematical means of calculating mean risks for Elements, Subsystems, and Failure modes, thereby providing better assessment of the risk and potential causes of mission failure.

Claims 64-70 recite apparatus for performing substantially the method(s) of claims 1-24, and are similarly rejected for reasons given above for the respective claim and claim elements, and further that Weinstock discloses automated methods performed by computer apparatus (see Figure 2).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Stoltz (US Appl. Pub. No. 2003/0125997) and Packwood (US Pat. No. 7,006,992) and Tschiegg, et al. (US Appl. Pub. No. 2005/0192963) and Miller, et al. (US Appl. Pub. No. 2005/0021360) and Bladen, et al. (US Appl. Pub. No. 2002/0099586) teach automated methods and systems for generalized risk assessment with substantial features of the claimed invention.

Aldred et al. (US Pat. No. 7,003,439) and Koederitz et al. (US Pat. No. 7,243,735) teach automated methods for minimizing risk and ensuring design success for wellbore operations.

Goldman et al. (US Pat. No. 6,109,368), Goldman et al. (US Pat. No. 7,032,689), Goldman et al. (US Pat. No. 6,408,953), King (US Pat. No. 6,612,382), Goldman et al. (US Pat. No. 7,261,167), King (US Pat. No. 7,085,696) and Goldman et al. (US Pat. No. 7,357,196) teach automated methods and a system for predicting performance of a drilling system for a given Earth formation.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is (571)272-8220. The examiner can normally be reached on 9 am to 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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